

WHAT IS CLAIMED IS:

- 1               1. An isolated nucleic acid encoding an SSG polypeptide, said  
2 polypeptide comprising an amino acid sequence that is at least about 70% identical to an  
3 amino acid sequence as set forth in SEQ ID NO:1 or 3.
- 1               2. The nucleic acid of claim 1, wherein said polypeptide specifically  
2 binds to polyclonal antibodies generated against a polypeptide that comprises an amino  
3 acid sequence selected from the group consisting of SEQ ID NO:1, SEQ ID NO:3, SEQ  
4 ID NO:5 and SEQ ID NO:6.
- 1               3. The nucleic acid of claim 1, wherein said polypeptide comprises an  
2 amino acid sequence selected from the group consisting of SEQ ID NO:1, SEQ ID NO:3,  
3 SEQ ID NO:5 and SEQ ID NO:6.
- 1               4. The nucleic acid of claim 1, wherein said polypeptide forms a  
2 dimer with a second ABC polypeptide, and wherein said dimer exhibits sterol transport  
3 activity.
- 1               5. The nucleic acid of claim 4, wherein said dimer is a heterodimer.
- 1               6. The nucleic acid of claim 4, wherein said sterol is cholesterol.
- 1               7. The nucleic acid of claim 5, wherein said second ABC polypeptide  
2 is ABC8.
- 1               8. The nucleic acid of claim 1, wherein said nucleic acid hybridizes  
2 under moderately stringent hybridization conditions to a nucleic acid comprising a  
3 nucleotide sequence as set forth in SEQ ID NO:2 or 4.
- 1               9. The nucleic acid of claim 8, wherein said nucleic acid hybridizes  
2 under stringent hybridization conditions to a nucleic acid comprising a nucleotide  
3 sequence as set forth in SEQ ID NO:2 or 4.
- 1               10. The nucleic acid of claim 1, wherein said nucleic acid comprises a  
2 nucleotide sequence at least about 70% identical to a sequence as set forth in SEQ ID  
3 NO:2 or 4.

1               11. The nucleic acid of claim 1, wherein said nucleic acid comprises a  
2 nucleotide sequence as set forth in SEQ ID NO:2 or 4.

1               12. The nucleic acid of claim 1, wherein said nucleic acid is greater  
2 than 502 nucleotides in length.

1               13. The nucleic acid of claim 1, wherein said nucleic acid is from a  
2 mouse or a human.

1               14. The nucleic acid of claim 1, wherein said nucleic acid is expressed  
2 in the intestine or in the liver in the presence of an LXR agonist.

1               15. The nucleic acid of claim 1, wherein said nucleic acid is expressed  
2 in a tissue selected from the group consisting of liver, jejunum, ileum, and duodenum.

1               16. An isolated nucleic acid encoding an SSG polypeptide, said  
2 polypeptide comprising an amino acid sequence selected from the group consisting of  
3 SEQ ID NO:5 and SEQ ID NO:6.

1               17. An expression cassette comprising the nucleic acid of claim 1  
2 operably linked to a promoter.

1               18. An isolated cell comprising the expression cassette of claim 17.

1               19. An isolated SSG polypeptide, said polypeptide comprising an  
2 amino acid sequence that is at least about 70% identical to an amino acid sequence as set  
3 forth in SEQ ID NO:1 or 3.

1               20. The isolated polypeptide of claim 19, wherein said polypeptide  
2 selectively binds to polyclonal antibodies generated against a polypeptide comprising an  
3 amino acid sequence as set forth in SEQ ID NO:1 or 3.

1               21. The isolated polypeptide of claim 19, wherein said polypeptide  
2 comprises an amino acid sequence as set forth in SEQ ID NO:1 or 3.

1               22. The isolated polypeptide of claim 19, wherein said polypeptide  
2 forms a dimer with a second ABC polypeptide, and wherein said dimer exhibits sterol  
3 transport activity.

1                   23. The isolated polypeptide of claim 22, wherein said dimer is a  
2 heterodimer.

1                   24. The isolated polypeptide of claim 23, wherein said second ABC  
2 polypeptide is ABC8.

1                   25. The isolated polypeptide of claim 22, wherein said sterol is  
2 cholesterol.

1                   26. The isolated polypeptide of claim 19, wherein said polypeptide is  
2 expressed in the intestine or in the liver in the presence of an LXR agonist.

1                   27. The isolated polypeptide of claim 19, wherein said polypeptide is  
2 expressed in a tissue selected from the group consisting of the liver, jejunum, ileum, and  
3 duodenum.

1                   28. The isolated polypeptide of claim 19, wherein said polypeptide is  
2 from a mouse or a human.

1                   29. An antibody generated against the isolated polypeptide of claim 19.

1                   30. An isolated SSG polypeptide, said polypeptide comprising an  
2 amino acid sequence selected from the group consisting of SEQ ID NO:5 and SEQ ID  
3 NO:6.

1                   31. A method of making an SSG polypeptide, the method comprising:  
2                   (i) introducing a nucleic acid of claim 1 into a host cell or cellular extract;  
3 and

4                   (ii) incubating said host cell or cellular extract under conditions such that  
5 said SSG polypeptide is expressed in the host cell or cellular extract.

1                   32. The method of claim 31, further comprising recovering the SSG  
2 polypeptide from the host cell or cellular extract.

1                   33. A method of identifying a compound useful in the treatment or  
2 prevention of a sterol-related disorder, said method comprising contacting an SSG  
3 polypeptide with a test agent, and determining the functional effect of said test agent upon

4 said polypeptide, wherein a functional effect exerted on said polypeptide by said test  
5 agent indicates that said test agent is a compound useful in the treatment or prevention of  
6 said sterol-related disorder.

1               34.     The method of claim 33, wherein said sterol is cholesterol.

1               35.     The method of claim 33, wherein said polypeptide comprises an  
2 amino acid sequence that is at least about 70% identical to an amino acid sequence as set  
3 forth in SEQ ID NO:1 or 3.

1               36.     The method of claim 33, wherein said polypeptide is present in a  
2 cell or cell membrane.

1               37.     The method of claim 33, wherein said polypeptide is bound to a  
2 heterologous ABC polypeptide, forming a heterodimer.

1               38.     The method of claim 33, wherein said functional effect comprises  
2 an increase in the sterol transport activity of said polypeptide.

1               39.     The method of claim 33, wherein said functional effect comprises a  
2 physical interaction between said test agent and said polypeptide.

1               40.     The method of claim 39, wherein said physical interaction is  
2 detected using a direct binding assay.

1               41.     The method of claim 33, wherein said sterol-related disorder is  
2 sitosterolemia.

1               42.     The method of claim 33, wherein said sterol-related disorder is  
2 selected from the group consisting of hypercholesterolemia, hyperlipidemia, gall stones,  
3 HDL deficiency, atherosclerosis, and nutritional deficiencies.

1               43.     A method of identifying a compound useful in the treatment or  
2 prevention of a sterol-related disorder, said method comprising contacting with a test  
3 agent a cell that expresses or is capable of expressing an SSG polypeptide, and  
4 determining the functional effect of said test agent upon said cell;

5                   wherein a functional effect exerted on said cell by said test agent indicates  
6                   that said test agent is a compound useful in the treatment or prevention of said sterol-  
7                   related disorder.

1                  44.       The method of claim 43, wherein said sterol is cholesterol.

1                  45.       The method of claim 43, wherein said SSG polypeptide comprises  
2                   an amino acid sequence that is at least about 70% identical to an amino acid sequence as  
3                   set forth in SEQ ID NO:1 or 3.

1                  46.       The method of claim 43, wherein said compound produces an  
2                   increase in the expression of an SSG gene that encodes said SSG polypeptide.

1                  47.       The method of claim 46, wherein said increase in the expression of  
2                   said SSG gene is detected by detecting the level of SSG mRNA in said cell.

1                  48.       The method of claim 46, wherein said increase in the expression of  
2                   said SSG gene is detected by detecting the level of SSG polypeptide in said cell.

1                  49.       The method of claim 46, wherein said increase in the expression of  
2                   said SSG gene is detected by detecting the level of SSG protein activity in said cell.

1                  50.       The method of claim 43, wherein said compound modulates the  
2                   level of sterol transport activity in said cell.

1                  51.       The method of claim 50, wherein said sterol transport activity in  
2                   said cell is detected by detecting the rate of sterol efflux in said cell.

1                  52.       The method of claim 51, wherein said sterol is cholesterol.

1                  53.       The method of claim 46, wherein said increase in the expression of  
2                   said SSG gene is mediated by LXR or RXR.

1                  54.       The method of claim 43, wherein said sterol-related disorder is  
2                   sitosterolemia.

1                  55.       The method of claim 43, wherein said sterol-related disorder is  
2                   selected from the group consisting of hypercholesterolemia, hyperlipidemia, gall stones,  
3                   HDL deficiency, atherosclerosis, and nutritional deficiencies.

1               56. A method of treating or preventing a sterol-related disorder in a  
2 mammal, said method comprising administering to said mammal a compound that  
3 increases the level of expression or activity of an SSG polypeptide in a plurality of cells  
4 of said mammal.

1               57. The method of claim 56, wherein said sterol is cholesterol.

1               58. The method of claim 56, wherein said sterol-related disorder is  
2 sitosterolemia.

1               59. The method of claim 56, wherein said sterol-related disorder is  
2 selected from the group consisting of hypercholesterolemia, hyperlipidemia, gall stones,  
3 HDL deficiency, atherosclerosis, and nutritional deficiencies.

1               60. The method of claim 56, wherein said compound produces a  
2 decrease in the amount of dietary sterol that is absorbed in said mammal.

1               61. The method of claim 56, wherein said compound produces a  
2 decrease in the amount of sterol that is retained in the liver of said mammal.

1               62. The method of claim 56, wherein said compound is identified using  
2 the method of claim 33 or 43.

1               63. The method of claim 56, wherein said compound causes an  
2 increase in LXR or RXR activity within cells of said mammal.

1               64. A method of prescreening to identify a candidate therapeutic agent  
2 that modulates SSG activity in a mammal, the method comprising:

3               providing a cell which comprises an SSG polypeptide; and  
4               a test compound; and

5               determining whether the amount of sterol transport activity in said cell is  
6 increased or decreased in the presence of the test compound relative to the activity in the  
7 absence of the test compound;

8               wherein a test compound that causes an increase or decrease in the amount  
9 of sterol transport activity is a candidate therapeutic agent for modulation of SSG activity  
10 in a mammal.

1               65.     The method of claim 64, further comprising a secondary step,  
2     wherein said test compound is administered to a mammal, and the absorption of dietary  
3     sterol in said mammal is detected.

1               66.     A method of inducing the expression of an ABC gene in a  
2     mammalian cell, said method comprising increasing the level of LXR or RXR activity in  
3     said cell.

1               67.     The method of claim 66, wherein said ABC gene encodes a protein  
2     that is involved in the transport of a sterol.

1               68.     The method of claim 67, wherein said ABC gene is selected from  
2     the group consisting of SSG, ABC1 and ABC8.

1               69.     The method of claim 67, wherein said sterol is cholesterol.

1               70.     The method of claim 66, wherein said LXR or RXR activity is  
2     increased by administering an LXR or RXR agonist to said cell.

1               71.     The method of claim 66, wherein said cell is present in a mammal.

1               72.     The method of claim 66, wherein said cell is a liver, intestinal, or  
2     kidney cell.

1               73.     An isolated nucleic acid comprising at least one nucleotide  
2     sequence selected from the group consisting of exon 1 (SEQ ID NO:7), exon 2 (SEQ ID  
3     NO:8), exon 3 (SEQ ID NO:9), exon 4 (SEQ ID NO:10), exon 5 (SEQ ID NO:11), exon 6  
4     (SEQ ID NO:12), exon 7 (SEQ ID NO:13), exon 8 (SEQ ID NO:14), exon 9 (SEQ ID  
5     NO:15), exon 10 (SEQ ID NO:16), exon 11 (SEQ ID NO:17), exon 12 (SEQ ID NO:18)  
6     and exon 13 (SEQ ID NO:19).

1               74.     The isolated nucleic acid sequence of claim 73, further comprising  
2     at least one intron.